RECORDS OF THE PAST

VOL. VI PART II

FEBRUARY, 1907

THE NEBRASKA LOESS MAN

ACTUATED by a desire to determine, if possible, who were the inhabitants of the Missouri Valley, especially in Douglas County, Nebraska, and Pottawattamie County, Iowa, who have left many traces on both sides of the river, I began a series of investigations which have been carried on intermittently for 3 years past. Data on the subject there was almost none. This fact led to inquiry and resulted in my learning that practically nothing had been done here either by the American Bureau of Ethnology, the states interested, or by museums. A few private individuals, actuated by the same motives which have influenced me in my investigations have done something, but unfortunately have left little in the way of documents upon which could be based even a start in this line.

The entire valley is even to-day a storehouse filled with abundant evidence that it has in the past been the home of a vast population, probably outnumbering its present population by many thousands of souls. Prince Maximillian mentions that he had found the remains of Mandan lodges from a point well up in North Dakota to the river's mouth, and implements similar to known Mandan blades, drills, axes, projectile points and scrapers I have found about these very remains of which Maximillian speaks. Besides these stone implements the whole tract is positively covered with potsherds, showing considerable skill in manufacture. I have in my collection 42 different pot rim

LONG'S HILL

At Long's hill there is a continuous section along the roadside from base to summit. Incident to the wear of travel and guttering by rain, the road runs in a canyon with walls five to ten feet high.

designs, many of which are as perfect and symmetrical as if cut by a modern artisan. A vast amount of reading of the history of the tribes of Indians, which have at various times lived in this vicinity or roamed this section of Iowa and Nebraska, has failed in determining that they manufactured pottery of any description. Whatever literature upon the subject, beginning with Lewis and Clark and ending with Father DeSmet, to which I have had access, disproves any suggestion that they ever made either flint implements or pots in which they cooked their food. All the evidence I have in my possession secured in field work goes to prove that the people who lived in the large lodges, the remains of which are scattered by the hundreds throughout this section, were of an intelligence far ahead of the Indians of this part of the west in historic times.

It was after investigating many score of burial mounds north of Council Bluffs, Iowa, where each one of the thousands of conical, weathered, loess knolls and bluffs contains a grave of an unknown people, that I turned my attention to Nebraska. I at first searched out and mapped some 40 odd lodge circles ranging from 50 to 90 ft. in diameter, and from 3 to 5 ft. deep in the center. I have determined to my complete satisfaction that the plan of these lodges conforms exactly to that left by Prince Maximillian, even to the cache opposite the entrance and beyond the fireplace in the center. Turning to the

mounds I at first opened the graves of Indians whose effects, placed with the remains, indicated contact with the whites. I learned to differentiate between them and the older burial places and whenever possible re-covered the remains as I had found them.

In the summer of 1906 I began operations in a mound situated 3 miles north of the little village of Florence, Nebraska, and in following down an old excavation in a sort of preliminary effort, I ran across what is now known as the skull of the "Nebraska Loess Man No. 5."

SKULL NO. 6, NEBRASKA LOESS MAN

Top view showing thick prominent brows, frontal bone without eminences, right and left parietal, and inter-parietal at the very back. The sutures are deeply dentate. Specimen No. 6-1-11-06, The Robert F. Gilder collection, the State University Museum. Negative No. 9-1-11-06, Hon. Charles H. Morrill's collection of Geological photographs.

I was considerably startled when I had brought the skull from the ground and at once saw that it was a cranium of remarkable characteristics. It lay in what I took to be a baked clay matrix. Before I reached the skull I had worked through earth similar to other cover-

ings of remains in the neighborhood and through several inches of what appeared to be earth and ashes, beneath which was the stratum which looked as if it had been burned. I had not at that time learned that an intrusive burial had taken place, and naturally concluded that the earth had been baked over the skull in order to prevent the leaching of the bones by rains. Near the skull was a jumble of leg, arm, pelvic, and other bones, many of which went to powder on being removed.

In following down the line of what I believed was the bones of the lower extremeties, I ran onto the skulls of the intrusive burial. There were two of the latter and I was able to secure the larger bones of 3 skeletons in an excellent condition. My first operations, covering 4 days, resulted in securing parts of 5 crania, including broken jaw bones and teeth. At one point of the two trenches which I ran through the mound, I found a lower jaw with the teeth almost intact, but not another bone of any sort within 3 ft.

Skulls Nos. 1 and 2 were filled with earth and small pieces of charcoal. Immediately above the bones of what I shall call the "upper layer" I found more than a score of Sioux quartzite spalls, evidently fractured from drift. Two very fair flint blades and a three-cornered knife were also found on this level. These implements are similar to many I have found in and about the lodge circles of the vicinity. With the bones of the lower level were flat pieces of diorite, which might or might not be crude implements. They do not show any attempt at grinding, smoothing, or flaking.

On November 8 and 16 I was accompanied in my investigation by Prof. Erwin H. Barbour, of the University of Nebraska, who at once assumed charge of the expedition whose research has resulted in establishing the status of the find and who will describe the results in a manner infinitely more interesting and practical than lies within my power.

On November 30 I was able to secure the only missing link in the history of Long's hill mound and to add still another cranium to the collection of the State museum. This link was furnished by Mr. Charles S. Huntington, a well-known business man of Omaha, and is as follows:

In the month of June, 1894, Mr. Charles S. Huntington, William Morris, and Frederick Parker, the latter a man of great wealth, inspired by a paper which appeared in the *American Antiquarian,* on *Antiquities of the Missouri Bluffs,* read before the Academy of Sciences, Des Moines, Iowa, in December, 1880, by Mr. S. D. Proudfit, of Glenwood, Iowa, began an investigation into the burial mounds of the northern part of Douglas County, Nebraska. They secured several finely made stone axes and a few crania. They excavated a deep hole some 5 ft. square in the summit of Long's hill and secured a skull. This cranium fell to the lot of Mr. Huntington, and he carried it to his home in Omaha and stowed it away in a garret. The skull was badly shattered and he, believing that it was simply that of a flat-headed

JAW OF SKULL NO. 6

Molar number 3 worn to gum, numbers 2 and 1 in a diminishing ratio. Negative No. 1-11-06.

Indian, gave it little consideration. The skull lay undisturbed nearly 12 years. When my find was first featured Mr. Huntington was out of the city. He returned Christmas Day after 3 months' absence, and coming across a copy of the Omaha *World-Herald* of October 21, in which the first account of the find appeared, he at once recognized from the description that the skull he had unearthed 12 years before bore many similarities to those taken from Long's hill. He at once notified me and I immediately recognized the type as that of the lower layer. Mr. Huntington presented me with the skull and it will be placed with the others of the collection in the Nebraska State Museum at Lincoln. Mr. Huntington stated that the skull had been taken from a 5 ft. level in compact, unmoved earth, which he declared surprised the entire party not a little. He says there were no other bones in the vicinity of the skull. Messrs. Parker and Morris are now both dead.

I am under great obligations to Mr. Manuel Long, the owner of the property where the excavations were made, who has given me an exclusive right to excavate on his land, and also to Mr. John Bankey, a farmer of the neighborhood, who assisted in excavating work at the hill and in adding material parts of the bones which had been otherwise lost in the earth exhumed at the time of my earlier excavations.

ROBERT F. GILDER.

Omaha, Nebraska.

SECTION OF LONG'S HILL

A geologic section near Long's hill, on which Gilder's mound is situated. The road to the left is on Carboniferous shale, upon which rests glacial drift as thick as 40 feet, just back of the telegraph pole. Above the drift rises loess showing charactertistic vertical wall and columnar structure. Negative No. 2-30-11-06, Hon. Charles H. Morrill's collection of Geologic photographs, the University of Nebraska.

ANCIENT INHABITANTS OF NEBRASKA

THE exaggerated and misleading reports in the current numbers of the press respecting the Nebraska Man are greatly to be deplored by those who are moved by a scientific spirit. It becomes, therefore, the more desirable that the facts respecting an ancient type of man recently discovered in Nebraska be presented in as authentic a manner as possible, with a view to the correction of error. The history of the discovery and facts pertaining thereto are described in this magazine by the discoverer himself, and the writer will devote his attention more particularly to the geological facts as known at present. The importance of this discovery hinges, as we believe, on its exact stratigraphic position. That is, the writer views these human remains as fossil man.

Occurring in the loess, as they do, seems to establish evidence of glacial man in America, and it is for the stratigrapher or glacialist to determine with nicety to which glacial or interglacial epoch they shall be referred. The glacial drift on which the loess rests is Kansan,

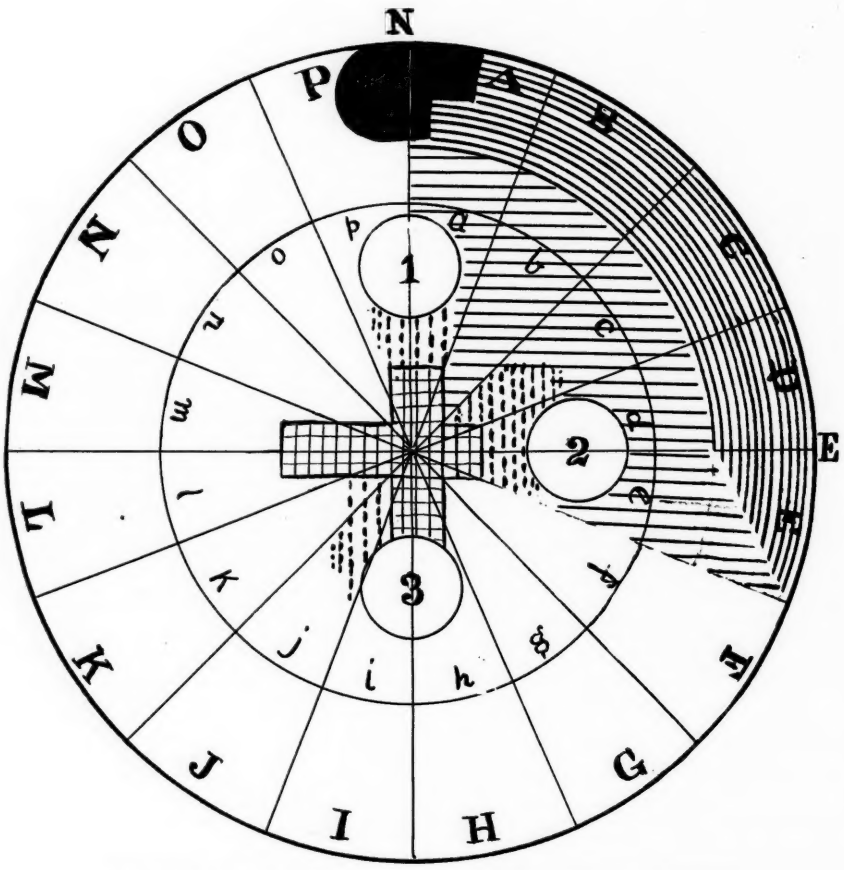
while the loess may be Iowan or more likely Wisconsin. However young this loess may be, it is nevertheless old, and carries man well back to glacial times, toward which all the lines of evidence have so steadily been converging.

Long's hill, on which Gilder's mound is located, is a hill, or the hilly terminus of a ridge, cut out of the main loess body by streams tributary to the Missouri River. The apex of the hill is 200 ft. above water lever, and 150 ft. above the Missouri River valley, out of which it rises. From the bottom of the hill to the top there is a continuous section along the roadside.

From this hill to Florence, a distance of 3 miles, there is a section nearly 3 miles long. The level road along the bluff leading to Long's hill is exactly on the top of the Carboniferous, upon which there rests 10 to 20, and in places even 40 ft. of drift, readily distinguishable as such. Above the drift comes 150 to 200 ft. of loess, according to the spot where the section is taken. The section at Long's hill reads Carboniferous, overlaid by 10 to 20 ft. of glacial drift, overlaid by 150 ft. of loess.

Only a few years ago the Missouri River was trenching and undercutting the banks, and land slides are in evidence everywhere. They must be reckoned with in all stratigraphic work done in this region. It should be interposed that the simple geology at Long's hill does not seem to have been complicated by land slides. Early in October Mr. Robert F. Gilder discovered a number of human bones which he presented at once to the University of Nebraska Museum. The writer immediately began critical coöperative investigation, and the work of exploration continued to December 1.

Facts were obtained which lead to the conclusion that 3 races of men are represented in this spot, the oldest being of the loess and synchronous with that stage of glaciation. The next above them are distinct mound builders, among whose bones occurred the skull of a modern Indian buried intrusively, and differing from the others in color, texture, and thinness of skull wall. This skull is quite complete and may be pronounced relatively advanced, having small brows and a good forehead. The two mound builder skulls had prominent brows and retreating foreheads, with distinct but small frontal eminences, while the skulls of the Loess Man had thick, protruding superciliary ridges or brows, very low retreating foreheads, without frontal eminences. The last named was found in undisturbed loess, and all the evidence shows they were not buried but were deposited. The first named were buried in a two and a half foot layer of loess plainly disturbed by digging and burying, it being a mixture of black surface soil and light buff loess. The bones of the Nebraska Loess Man, as we have named him, doubtless antedate the hill, while those of the mound builder seem to be subsequent to it. It is assumed that archaic burial in loess could not have taken place in such a manner as to escape detection. It is further assumed as improbable that primitive people not provided with



A DIAGRAM OF THE EXCAVATIONS AT GILDERS MOUND

The cross lines show the cross trenches dug by Mr. Gilder, the dotted lines the extension by Mr. Gilder and the writer, November 8, 1906. The circles 1, 2, 3, are shafts sunk 8 feet deep by Dr. George E. Condra and the writer, November 16, 1906, the horizontal lines indicate an area excavated to a depth of 6 feet, the concentric lines in sectors A, B, C, D, an area lowered to about 9 feet. The black represents a shaft sunk to 12 feet, bone fragments occurring all the way to 11½ feet. The outer circle has a diameter of 30 feet, the inner one, which is the mound, has a diameter of 18 feet. The bulk of the material found to date lay between 1, 2, 3, and A and P.

implements would dig graves and bury their dead 12 ft. deep. And it is still further assumed that they would not bury them as water-worn fragments, and as widely-scattered and unrelated bits.

Associated with these loess bones are such loess fossil as Anadonta, Polygyra, Succinea, and the bones of some mammal, presumably a young wolf with epiphyses wanting.

The lithologic structure of the loess is not disturbed, the characteristic vertical lime tubes and concretions being present. There are occasional angular pebbles and bits of flint, and possibly flint imple-

ments, which, if such, are too crude for distinct recognition. They resemble frost spalls. Some of these spalls or chips are plainly from the Fusulina flints of the Carboniferous so may be of local origin. Spalls, loess fossils, bits of human bone, are so widely scattered that but 5 or 6 bits can be found to the cubic yard of loess. Paleontologically the strongest evidence of the antiquity of these remains must come from the skull, the other skeletal parts being subject to wide variation.

No evidence of stratification has appeared in this loess bone bed, nor have any extinct remains been found associated with the human

MANDIBLE FROM GILDERS MOUND

Mandible of a youthful person found 4 feet deep in loess broken in 3 pieces and all teeth gone save 3 molars. From specimen in the Robert F. Gilder collection, State University Museum.

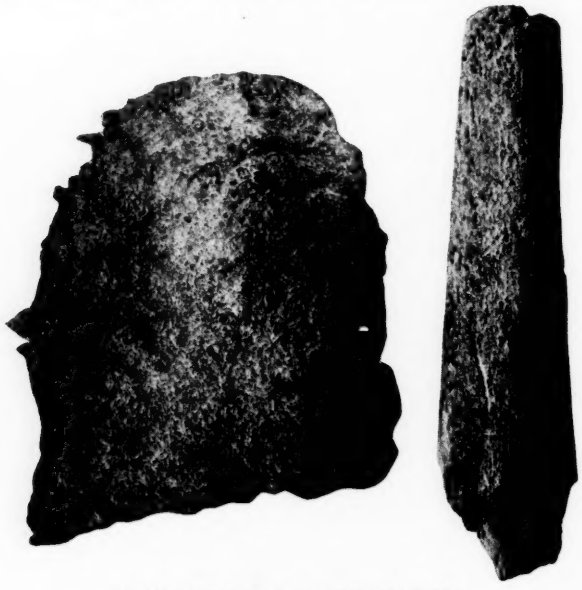
bones. Counting all skull fragments there are probably 10 or 12 individual skulls from this layer and comparison shows them to be of the Neanderthal type, with thick cranial walls.

METHODS OF INVESTIGATION

As soon as it was discovered that there was apparently a bone bed in the loess the strictest care was exercised in all succeeding work. The original cross trenches dug by Mr. Gilder were deepened and widened, scattered bone fragments were found on all levels to 6 ft. Twenty or thirty fragments were found on this occasion, including bits of ribs, portions of limb bones, a clavicle, metatarsal No. 1, scapula, and fragments of skull, although the number would have been greater had their relation to the loess been discovered earlier.

At a depth of 5 ft. was dug out of the loess a scapula in form and proportion unlike the average human shoulder blade. The acromion is not deflected, but is in line with the spine, which is broad and strong and continuous, without constriction to the internal scapular border.

A very interesting bit was the left half of a frontal bone exhumed in loess at a depth of nearly 5 ft. Later the other half was dug up some 4 ft. farther east in the trench. These two halves make an interesting frontal of what once was a low-browed skull, as shown in the accompanying figure. A week later work was resumed, the writer being again accompanied by Mr. Gilder and Dr. George E. Condra. The precaution was taken to remove all surface material so that nothing could fall into the trenches, and 3 wide shafts were sunk to the depth



BONES FROM GILDERS MOUND

A fragment of skull and bone, each pitted and etched, found 4 to 5 feet deep in undisturbed loess. Characteristic bits. The skull to which this fragment belongs was scattered over a space 5 by 5 feet, and was taken out and preserved in blocks.

of 8 ft. on the northern, eastern, and southern points at a distance of 7 to 8 ft. from the center, or close upon the outer limit of the mound, which is about 18 ft. in diameter. Each shovelful of earth was taken in hand as dug out and was carefully scrutinized, all bone fragments carefully saved and properly recorded. As far as possible each fragment was preserved in a block of loess. In all about 20 bits were found as follows: a weathered occipital bone showing occipital protuberance and crest, inferior and superior cerebellar fossæ, fragments each of limb bones, scapula, sacrum, clavicle, calcaneum, 3 vertebræ, 2 metatarsals, and a jaw. The metatarsals are straight in every case

and not arched after the manner of modern man. The jaw found at the depth of 4 ft. is that of a youth with cusps of the teeth scarcely worn. Old age can not be assigned as the reason for the absence of all teeth save 3 molars, as shown in the figure.

In accounting for this one is led to remember the frequent occurrence of toothless jaws in Bad Land clays and Loup Fork sands. Just as the teeth in water-soaked jaws are loosened and tend to drop out, so it seems to have been with this human mandible. No other bones or teeth were found near this jaw.

Some of the above bits were but slivers, others bits 2 to 3 inches long, being more or less worn, etched, and gnawed.

HUMAN JAW

Portion of a human jaw in a block of loess, the front half weathered off. Found in undisturbed loess at a depth of 5 feet, in sector D, near circumference.

Along with them occurred bits of the shell Anadonta, Succinea avara, angular pebbles and loess concretions. A few days later when work was again resumed, the writer was accompanied and aided by Dr. Condra, also by Edwin Davis and Paul Butler, members of the Morrill Geological expedition of 1906, and by Mr. Gilder, as time would permit. Systematic work continued for 3 days. A circle 30 ft. in diameter was laid off concentrically about the mound and divided into quadrants and these divided into sectors of 22½ degrees to facilitate recording.

The northeastern quadrant was excavated to an average depth of 6 ft., and a 3 foot strip on its periphery to a depth of 8 to 9 ft., and on the north point a shaft was sunk to 12 ft. Here a bone sliver 3 in. long was found at a depth of 11½ ft., an unusual if not a prohibitory depth for primitive burial. On one side of this shaft an unbroken prism, including black surface soil and loess subsoil, was cut out, boxed and shipped bodily, to be mounted and exhibited in connection with the bones found in it.

A moment's reflection will show that a large amount of material was removed, at least 40 cubic yards, and yet a trifle less than 200 fragments were found, being 5 or 6 bits to the cubic yard, or a bone fragment for every 5 or 6 cubic feet of earth, thus showing how widely they were scattered. No whole bones were found save 3 or 4 finger bones. Out of this set of fragments the following pieces seem worthy of especial attention here: The half of a jaw with a solitary molar tooth, the condyle angle and symphysial region weathered off, fragments of two other unrelated jaws, and a bony palate with the two back molars in place. The prize specimen found on this occasion was a skull broken, disarticulate and scattered over a space 5 by 5 ft. This was quarried out in blocks and will be preserved as such to illustrate the mode of occurrence. The skull wall is thick, measuring as much as 9 m m, or ⅜ of an inch. One of the fragments of this skull is figured to show its pitted and etched surface. The writer has seen two other places where human bones have been found in the loess, distant from Gilder's mound a full mile in each case. In the meantime Mr. Gilder has extended the work of exploration and reports human bones in the loess in several new localities near Long's hill.

All this is more or less confirmatory of the existence of a loess bone-bed. During the writer's residence in Nebraska he can recall many occasions when students reported human bones in the loess of their community. On several occasions they have brought skulls identical with the present ones, if memory is reliable. None of these reports were verified, and yet they are a certain kind of evidence. In the State Historical Society there are skulls more or less fragmentary which seem to be of the loess type. Altogether there is at hand considerable evidence direct and indirect.

The lines of evidence everywhere have been leading toward belief in glacial man in America, and possibly the loess beds in Florence may furnish proof. Work is to be continued and everything possible is to be done for the sake of scientific accuracy. Everything is to be so ordered and arranged as to facilitate archæologists and geologists in the detection of errors and inaccuracies.

ERWIN HINCKLEY·BARBOUR.

The University of Nebraska, December 20, 1906.

ANNUAL MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE American Association for the Advancement of Science held its 57th meeting in New York from December 27, 1906, to January 2, 1907. The meetings of this Association, which were formerly held in the summer, are now made the occasion of a general convocation of scientific societies during the Christmas holidays. The Association itself is divided into 11 sections, each meeting independently, and there are 20 affiliated societies, each holding separate meetings during the convocation. There is, therefore, an embarrassment of riches for the reporter, and the papers of interest to the student of archæology and history are scattered in so many sections that it is no small task to get hold of them all.

Attending first the session of the anthropological section we make note of the following papers: Some *Phases of Prehistoric Archaeology,* by Dr. George Grant McCurdy; Notes on *Ancient Puebloan House Construction,* by Mr. F. S. Dellenbaugh; *The Archaeology of Manabi, Ecuador,* by Prof. Marshall H. Saville; *The Aboriginal Use of Turquoise on the American Continent,* by Mr. George F. Kunz; *The Art of Glazing Among the Ancient Pueblos and the Relation of the Pueblo Indians of the Rio Grande Valley to the Ancient Cliff Dwellers of the Adjacent Plateaus,* by Mr. Edgar L. Hewett; *Pottery and Bone Objects Found in Vermont,* by Prof. George H. Perkins; *Recent Geological Changes as Affecting Theories of Man's Development,* by Prof. George Frederick Wright; *Racial Characteristics of the Humerus,* by Dr. Ales Hrdlicka; *Heredity in Head Form,* by Prof. Franz Boaz; and *The Harness Mound Exploration,* by Mr. William C. Mills. These and many other papers contain a vast amount of interesting information, but space permits us to give the details of only two.

According to Mr. Hewett, the art of glazing among the Pueblos was practised at a very early date, but the only method employed was that through the use of saline solution. After decorating the pottery it was washed in a saline solution and subjected to heat, which produced an enamel surface which was permanent. The early appearance of this art among the Pueblo Indians was certainly very striking.

Prof. Mills' report from the Harness Mound was of special interest. This mound, situated in the Scioto Valley, near Chillicothe, Ohio, is 160 ft. long, about 40 ft. wide, and 20 ft. high. In 1846 it was partially explored by Squier and Davis, who sunk a shaft from the center to the base and found what they supposed was an altar with

various relics. At a later date it was partially explored by Prof. Putnam, who dug a trench in from the south side to nearly the center of the mound. Numerous other partial explorations have been made by the representatives of the Smithsonian Institution. The result of all these explorations was that 15 burials were uncovered and a moderate number of implements of various sorts.

But Prof. Mills, in carrying on his work for the Ohio Archæological Society, made a clean work of exploration from one end to the other, with the astonishing result of bringing to light 130 burials and finding 1,217 implements of copper, a large number of bone implements of rare value and much finished pottery, revealing a special stage of culture.

The reason of the failure of previous explorers is owing to the fact that the burials were near the circumference of the base, so that a shaft sunk in the center was least likely to encounter anything of interest. Another interesting discovery was that of a series of post-holes, indicating that the burials were enclosed in wooden structures, which have since disappeared through decay. This fact brings the mounds of Ohio into an apparent connection with similar mounds found in Sweden, Southern Russia, the Crimea, and Central Asia, where the burials were first enclosed by stone structures and the whole covered by a mound of earth.

The extent of the commerce of the Mound builders is strikingly illustrated in all these explorations of Prof. Mills. Among the precious treasures deposited with the burials are numerous implements and ornaments of copper from Lake Superior, of obsidian from the Rocky Mountains, of mica from North Carolina, and of shells from the Gulf of Mexico, points distant 3,000 miles from each other. The full report of Prof. Mills' work will be awaited with much interest, especially as he for the first time finds indications of a higher culture among the early Mound builders than that which appears in later times.

As is to be expected, the Geological section had many papers of much archæological interest. Among the most important of these was one by Mr. Ellsworth Huntington upon *Deposits of Glacial Age in the Unglaciated Regions of Central Asia.* In his recent travels through Persia and Central Asia Mr. Huntington has brought to light new and striking evidences of the climatic changes which have taken place in that region since man came into existence. Surrounding all the interior basins of the region there are extensive post-tertiary gravel terraces showing the existence of vast beds of water where now there is nothing but drifting sand and general desolation. In these terraces in the Tarim Valley he found new sites of ancient cities, which have been buried beneath the accumulations of gravel. There can now be no longer any question that the migration of races from Central Asia has been largely influenced by climatic changes, and that the capacity of the country for the support of the population was far greater in ancient times than it is at present.

Papers of great interest were presented by Prof. Tarr and Mr. F. E. and C. W. Wright concerning the recent changes which have taken place in Alaska, illustrating the rapidity with which recession of glaciers may take place. Since Prof. George Frederick Wright and his associates investigated the Muir Glacier in 1886 its front has receded 6 or 7 miles, making an average rate of recession of nearly ½ a mile a year. There is no longer any doubt that, at the time of Vancouver's survey of Cross Sound, Glacier Bay was filled with glacial ice, as Prof. Wright maintained, fully 20 or 25 miles below the present front of the glacier.

On the other hand, some of the glaciers coming into Yakutat Bay and the eastern portion of the Malaspina Glacier have made sudden and rapid advance within 2 or 3 years. Large areas of ice near the front of these glaciers, whose surface was formerly so smooth that it could be readily traversed, had been broken up into serracs and crossed with fissures to such an extent that it is now impossible to overcome them. Prof. Tarr is inclined to think that this abnormal condition of things has been produced by an earthquake, which a few years ago set in motion immense snow-slides from the surrounding mountains, which brought so much material upon the upper part of the glaciers that they have produced a phenomena in the glacier analogous to the floods which occur in rivers having sources in mountains. It is well known that floods in the headwaters descend the river in a wave, whose progress the weather bureau forecasts, and upon which flat boats upon the Ohio, for example, float down with their burdens to their market places nearer the mouth of the streams; but in the case of a glacier the medium is so inelastic that the effect is a much longer time in being felt.

Those who recall the article in RECORDS OF THE PAST calling attention to the depth of the gorge of the Hudson River Valley as it passes New York City and crosses the bordering shelf of the continent submerged by shallow water, to the deep depression of the Atlantic Ocean, will be interested to learn that in the efforts of the engineers to carry an aqueduct for city water across the Hudson above West Point, it was discovered that the depth of the pre-glacial valley there is 489 feet, thus fully confirming the conjectures that in pre-glacial times the gorge followed by the Hudson was nearly twice as deep as it is at the present time.

Prof. W. G. Tight, of the University of New Mexico, presented interesting and most important evidence showing that the Bolivian Plateau in South America had been covered with vast sheets of glacial ice, coming down in recent times from the lofty peaks in the interior, thus showing that there was a glaciation of the southern hemisphere practically contemporaneous with that of the northern.

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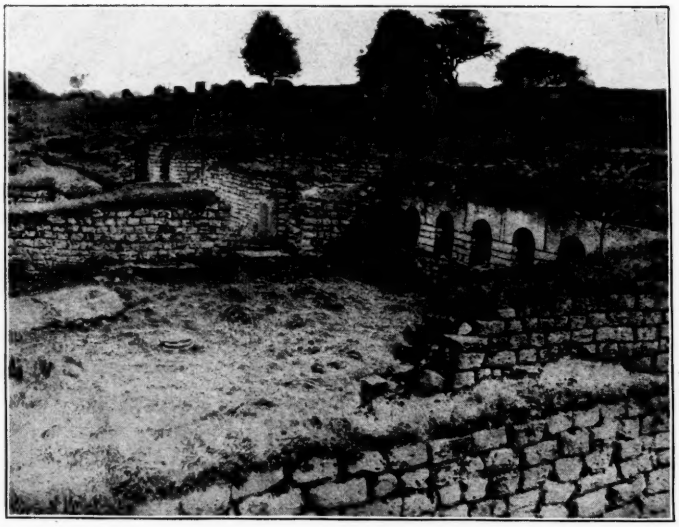


REMAINS OF THE VILLA OF THE COMMANDER OF THE "COHORT CASTELLUM" AT THE CHESTERS ON THE LINE OF THE "MURUS" IN NORTHERN ENGLAND

THE DEVELOPMENT OF THE SYSTEM OF BOUNDARY FORTIFICATIONS IN BRITAIN AND GERMANY, UNDER THE ROMAN EMPIRE

PART II

ROMAN BOUNDARY FORTIFICATIONS IN BRITAIN

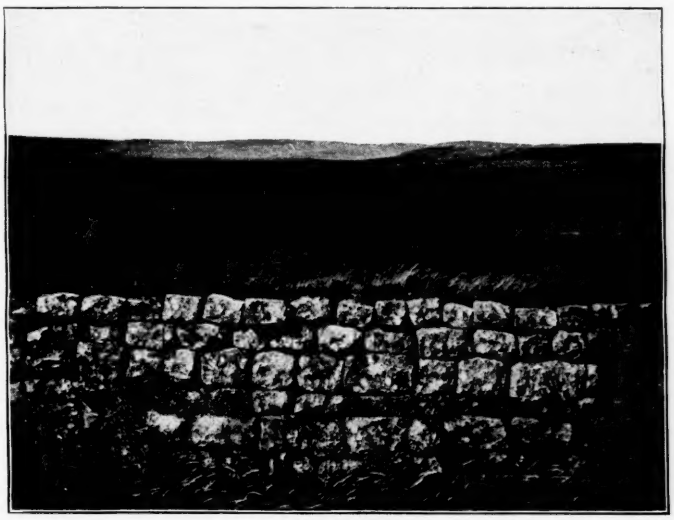
WE MAY now turn our attention to Britain and consider briefly the measures taken by the Romans during the earlier period of their rule in that island to provide for the security of their possessions. For it will appear that the boundary defenses in Britain and Germany developed for the most part along parallel lines from the period of Hadrian.

The first boundary which was established after the definite extension of Roman authority to Britain is thought to have extended from Colchester (Camolodunum) to Glevum (Gloucester). But the area of the province was soon enlarged and no visible trace of this early boundary has been left. According to one interpretation of a doubtful passage in Tacitus (Ann. XII, 31; *cf.* Furneaux's note), Ostorius Scapula, the second Roman governor of Britain (47-51 A. D.), adopted as the boundary of the province a line following the Severn, Avon, Trent and Humber, from the Bristol Channel to the North Sea. It is significant, perhaps, that a Roman road, the Foss Way, runs a little below this line and would have offered a means of communication between the forts (*castella*) which must have been erected at intervals

along the frontier. Later we find Ostorius engaged in fortifying with castella a boundary in South Wales against the Silures.[13]

During the years which followed immediately after the death of Ostorius little progress was made in enlarging the Roman province in Britain. Yet the words of Tacitus in this connection[14] point to the usual manner of advancing the military limits of the province. At all times in Britain detached forts seem to have existed beyond the regular boundary line. These were doubtless intended, during the earlier period, as outposts to prepare the way for a subsequent general advance.

At the time of Suetonius Paullinus (58-61 A. D.) Chester (Deva) and Lincoln (Lindum) were the more northern legionary camps.



THE "MURUS" NORTHERN ENGLAND

Cerialis (71-74 A. D.) reduced to subjection a portion of the Brigantes,[15] who dwelt in Yorkshire, and probably added to the Empire the site of York, which was later the most northern legionary fortress.

By 80 A. D. Agricola had probably carried the Roman arms to a point at or near the Northern Isthmus; he spent the following summer in securing the new territory by means of a line of fortified posts extending from the Forth to the Clyde.[16] These stations probably correspond in size with the small forts on Domitian's German boundary line and not with the larger cohort castella. After the recall of

[13]Tac. *Ann.* XII, 38.
[14]Tac. *Agricola,* 14 *paucis admodum castellis in ulteriora promotis;* cf. Herzog, p. 54.
[15]Tac. *Agric.* 17.
[16]Tac. *Agric.* 22, 23.

Agricola, in 85 A. D., this new line was abandoned, but probably not all the territory occupied by him was given up. For York (Eburacum) was almost certainly at this time the site of a legionary camp. Legionary camps, moreover, on land frontiers were always situated some distance to the rear of the actual boundary. It would follow, therefore, that there was still a considerable stretch of Roman territory north of York. Some isolated forts on the Lower Isthmus between Solway Firth and the estuary of the Tyne may have been erected by Agricola to secure the territory in the rear during his advance to the Firth of Forth in 79 and 80 A. D.[17] It is possible that these continued to be garrisoned as outposts after his recall.[18] But the earliest comprehensive system of works on this line is to be ascribed to Hadrian, who made changes and improvements in the system of defense on all the boundaries of the Empire.[19]

The continuous barrier carried in Hadrian's reign across the island from the Solway Firth, near Bowness, to the estuary of the Tyne, though consisting of earthen ramparts with an accompanying ditch, is usually referred to as the *vallum.* Hadrian's biographer, Spartianus (vit. Hadr. 12), says of Hadrian that he excluded the barbarians from the Empire by means of palisades along the land boundaries. There is a tradition to the effect that remains of stakes have been found on the vallum.[20] Their presence, if proved, would be striking evidence for the identification of the works which we are describing with those mentioned by Spartianus.

The vallum of Hadrian is made up of two parallel mounds with a fosse or ditch between them. They are distant 24 ft. from the northern and southern margin of the ditch respectively. The ditch had originally a flat bottom. Its dimensions vary. In many places it has been found to be 30 ft. wide and 7 ft. deep. At one point in the mound on the south side remains of a stone foundation have been discovered.[21]

The remains of about a dozen forts have been brought to light on the south side of the vallum. Two of these (Magnæ and Vindolana) were fortified with stone, the others with earthworks. Although some of them are separated from the vallum by an interval of one-half to three-quarters of a mile it is evident that they formed part of the same system of defenses. They were erected for the cohorts and alæ which were to defend the barrier. The arrangement was, therefore, essentially different from that of Domitian in the Taunus region. There the main garrisons were located in the interior of the province and detachments only were sent to the line of the boundary where small forts were erected for their protection. The course of the vallum in Britain has fewer deviations from a right line than the earlier limes of Domitian in Germany.

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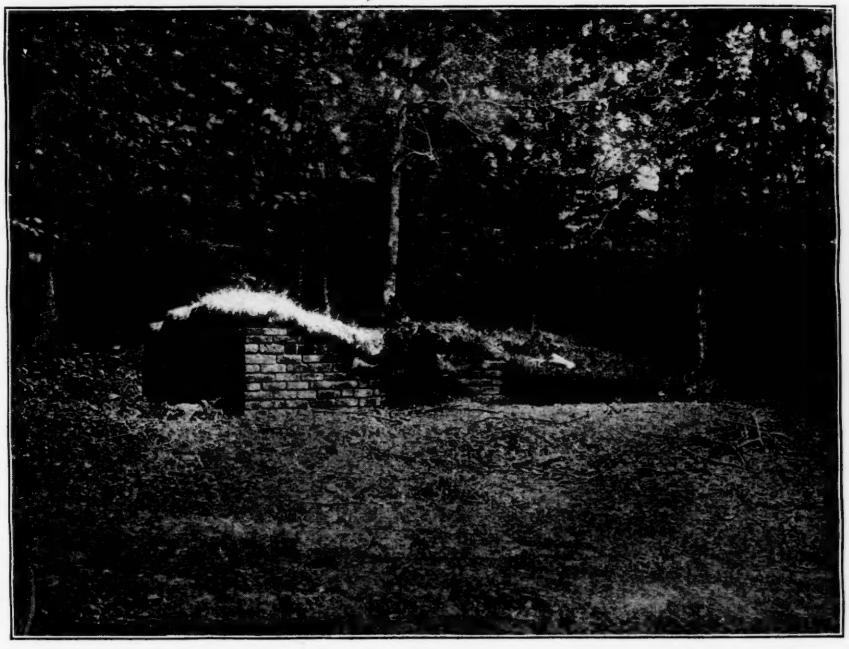
[17]Tac. *Agric.* XX, 21.
[18]Bruce, *Roman Wall,* p. 25.
[19]Dio Cassius, LXIX, 9.
[20]Krüger, op. cit. p. 5.
[21]Krüger, op. cit., p. 5.

SECTIONAL CUTTING IN THE ANTONINE VALLUM IN SCOTLAND, SHOWING THE STONE FOUNDATION OF THE EARTH MOUND



REMAINS OF A STONE TOWER ERECTED DURING THE REIGN OF ANTONINUS PIUS ON THE "LIMES" IN THE ODENWALD, GERMANY

The reforms of Hadrian mark a distinct epoch in the development of the works along the frontier boundary in Germany. The line there was straightened as much as possible, for in this period of undisturbed peace its administrative outweighed its military significance; nevertheless the limes was now fortified, along its whole extent, from the Rhine to the Danube. The defenses consisted of a palisade formed of stakes which were sunk into the ground to the depth of 4 ft. (1.4 meters) and secured by stones serving as wedges. The stockade was at least 6½ ft. (2 meters) high above ground. The stakes were of fir wood. They were tied together by other stakes fastened horizontally. At this time the cohorts and alæ, which had been stationed in the older forts between the Taunus range and the Main, were transferred to the boundary and provided with new fortresses. The new castella were not on the boundary line, but were separated from it by moderate intervals, as was the case also on the other portions of the German boundary. Some of the new camps had defenses in stone, others only earthworks. Their sites corresponded with those of the small forts of the earlier period at points where roads crossed the frontier. All these changes tended to increase the similarity of the arrangements in Germany with those of the new system of defenses in Britain.

Antoninus Pius reoccupied the older line of Agricola and erected a new barrier in Britain, probably in 143 A. D., extending from the Clyde to the Forth, a distance of 37 miles. This line of works, usually called the Antonine Vallum, consists of a turf rampart and ditch. Recent cuttings have shown that it stands upon a foundation layer of stone about 14 ft. broad. At the castellum of Castlecary the ditch, which forms the outside member of the Antonine fortification, was found to be 40 ft. across at the top and about 10 ft. deep. The rampart was separated from it by a berm 21 ft. in width.[22]

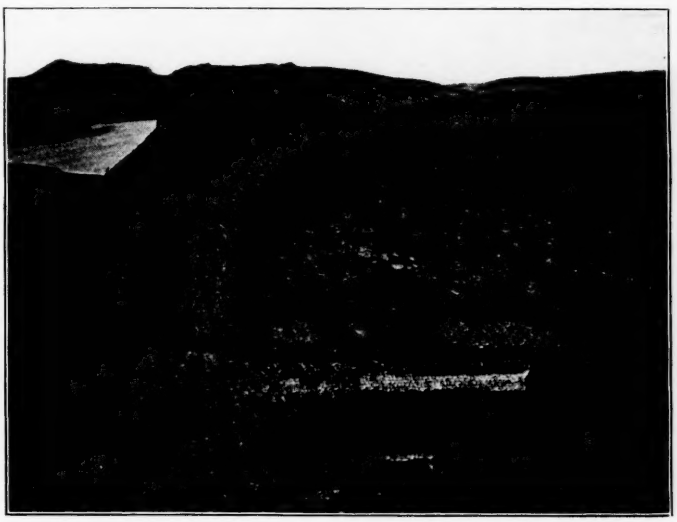
In locating the castella a new policy was adopted. They were placed in juxtaposition with the vallum so that the northern wall of each fort was in alignment with the turf rampart which crossed the island. Most of the forts on this line were probably defended by earthworks, but at least one of them, Castlecary, was provided with stone walls. In Scotland there exist remains of many detached forts between the vallum of Hadrian and that of Antoninus Pius and even north of the latter; but such are not found in Germany beyond the frontier.

The period of Antoninus Pius was one of activity on the frontier boundary in Germany also. Early in his reign many forts and towers were reconstructed in stone, especially in the Odenwald, between the Main and Neckar. But about 155 A. D. a new boundary line was laid off to the east of the Odenwald-Neckar line. It left the Main at Miltenberg and extended in almost a straight line to Welzheim near the northwest corner of Rhætia. The forts and towers on this line were

[22] *Excavation of Castlecary Fort on the Antonine Vallum*, reprinted from the Proceedings of the Society of Antiquaries of Scotland (Edinburgh, 1903), p. 19.

erected from the first in stone. In fact, from the time of Antoninus Pius all new structures of this class and restorations of old ones in Germany seem to have been in stone. This emperor did not locate the forts of the Miltenberg-Welzheim line directly on the frontier boundary, as he has done in Scotland, but a short distance to the rear.

The frontier fortifications in Germany reached the final stage in their development with the erection of the stone wall, the so-called "Teufelsmauer," along the boundary in Rhætia, and the construction of the earth rampart with accompanying ditch, the "Pfahlgraben," on the German line. The stone wall in Rhætia is exceptional in having no ditch. The date of construction of these works has not been determined, nor is it known even whether they were erected at the same time[23] The "Teufelsmauer" is 109 miles (175 kilometers) in length,



A "MILE CASTLE" WITH A PORTION OF THE "MURUS," NORTHERN ENGLAND

over a yard thick and at least 8 ft. (2½ meters) in height. The "Pfahlgraben" is over 200 miles (320 kilometers) long. The ditch which accompanies it was originally 19½ ft. (6 meters) broad and 8 ft. (2½ meters) deep. As a whole the line of defenses as thus constituted, including the stretch formed by the Main north of Miltenberg, was 342 miles (550 kilometers) in length and was provided with 80 forts and about 900 watch towers.[24]

The Emperor Septimius Severus either himself gave up the more northern barrier of Antoninus Pius in Britain, or made no attempt to

[23]Herzog (p. 76) is inclined to ascribe the erection of the stone wall to the period of Marcus Aurelius.

[24]H. Jacobi, *Tuhrer durch das Romerkastell Saalburg*, p. 5. Fabricius, *Die Enstehung der romischen Limesanlagen*, p. 13, gives the towers as over 1000 in number, the castella as 100.

THE COURSE OF THE "MURUS" NORTHEAST OF THE "CASTELLUM" OF HOUSESTEADS (BORCOVICUS)

recover it after a previous abandonment. He reinforced the works on Hadrian's earlier line by the construction of a new fortification, a turf rampart with a ditch, but the course of this new line of works lay to the north of Hadrian's vallum. The interval between the rampart and the ditch varies. It is usually 25 to 50 yards but in some places it is as much as 800 yards.[25] For the builder of the later turf wall was more concerned with securing points of vantage towards the north. The portion of the turf wall which has been brought to light, near the fort of Birdoswald (Amboglanna), is from 12 to 15 ft. in thickness and has a ditch with a V-shaped profile. The ditch is about 32 ft. broad and is separated from the rampart by a berm, or level strip of 10 ft. Stone forts were erected along the new line of defense, their northern walls being on a line with the course of the turf rampart.

At a later period,which has not been accurately determined, the turf rampart was replaced by a stone wall (*murus*). The stone wall seems to occupy the place of the earlier turf rampart throughout most of its course, so that the same ditch, somewhat enlarged, continued to be utilized. But for a distance of about 2 miles the line of the stone wall diverges from that of the turf rampart and runs to the north of it. This portion of the barrier includes the site of the fort of Birdoswald (Amboglanna); in this section vestiges of the turf wall have

[25]Bruce, p. 16, and Krüger, p. 8.

been discovered. The stone wall varies in thickness, the average being about 6 ft.[26] It was 80 Roman miles in length and originally not less than 12 ft. in height.

The same forts served for the turf rampart and the later stone wall. Their ramparts, erected in stone, had about the same thickness as the stone wall. At the time of building the wall some of the more important forts were extended towards the north so that they project for about a third of their length beyond this later fortified line. Birdoswald (Amboglanna) is an exception, for there the course of the stone wall lay to the north of that of the turf rampart, as has been explained. The extension of this fort carried its sides only up to the wall. The forts of this larger class have 6 gates, 2 on each of their long sides. The more northern of the side gates open at the points where the stone wall, if extended, would intersect their ramparts.

Besides the forts the wall was provided with smaller redoubts which are called mile-castles, because they are located at intervals of approximately a Roman mile. Their dimensions are about 60 by 50 ft. The wall forms their north side. There were also towers, probably 4 between every 2 mile-castles, having an area of about 10 by 12 ft., the wall formed their north side also. All the roads which passed to the north touched the forts and mile-castles.

GEORGE H. ALLEN.

University of Cincinnati.

ANNUAL MEETING OF THE ARCHAEOLOGICAL INSTITUTE OF AMERICA

THE Archæological Institute of America held its annual meeting in Washington from January 2 to January 5, 1907, Prof. Thomas Day Seymour, of Yale University, presiding. A large number of papers was presented, all of which have more or less general interest, but we have space here to call attention to only a few. In a paper by Prof. Charles C. Torrey on *Traces of Portraiture in Old Semitic Art,* it was shown through a series of illustrations that the faces which appear in Assyrian and early Babylonian sculptures are more individual than had been formerly supposed and were probable representations of actual kings. The conventional head-dress and beard, however, is so prominent that only close attention to the features brings this fact out. When seen together, so that comparison can be readily made, their individuality is clearly evident.

Prof. Harold N. Fowler, in an illustrated paper upon the *Beginnings of Greek Sculpture,* brought out clearly the fact that the sculptures in wood, which were found in Greece and which are of inferior char-

[26] See Bruce, p. 20, and Krüger, p. 3. According to Bruce the prevailing width is about 8 feet.

acter, were by no means representative of the earliest art. Its inferior character is in striking contrast to the sculptures in wood which were found in Egypt hundreds, probably thousands of years earlier.

We give below a full list of the papers:

Pre-Roman Antiquities of Spain, by Prof. Paul Baur; *Discobolia,* by Prof. John Pickard; *The Discovery, by Prof. Gustavo Giovanonni, of Curves in plan concave to the exterior in the facade of the Temple at Cori,* by Prof. William H. Goodyear; *Itlatlalnamictiliz Tepoztecatl,* by Mr. Edgar L. Hewett; *Mounds Discovered by the Ohio Archaeological Society,* by Prof. George Frederick Wright; *Archaeological Notes,* by Dr. Arthur Stoddard Cooley; *The Temple at Ostia,* by Mr. Albert W. Van Buren; *Sardes,* by Mr. Oliver M. Washburn; *An Interpretation of the So-called Harpy Tomb,* by Prof. Oliver S. Tonks; *Notes on Greek Vases at the University of Pennsylvania,* by Prof. William N. Bates; *The Beginnings of Greek Sculpture,* by Prof. Harold N. Fowler; *Vases Illustrating Some Points in the Occupation of Greek Women,* by Miss Gisela M. A. Richter; *The Visitation of Luca della Robbia at Pistoia,* by Prof. Allan Marquand; *The Dome in the Architecture of Syria,* by Prof. Howard Crosby Butler; *New Inscriptions from Sinope,* by Dr. David M. Robinson; *New Inscriptions from the Asclepieum at Athens,* by Prof. William N. Bates; *On the Stele Inscription in the Forum,* by Prof. Minton Warren; *Codrus' Chiron (Juvenal 3, 205) and a Painting from Herculaneum,* by Prof. Francis W. Kelsey; *Traces of Portraiture in Old Semitic Art,* by Prof. Charles C. Torrey; *Three Archaic Bronze Tripods in the possession of James Loeb, Esq.,* by Prof. George H. Chase; *Aphrodite and the Dione Myth,* by Dr. George Depue Hadzsits; *Pompeian Illustrations to Lucretius,* by Prof. Francis W. Kelsey; *Two Representations of the Birth of Dionysus,* by Dr. James M. Paton; *Archaeological Treasures of the Crimea,* by Prof. George Frederick Wright; *The Relative Importance of Casts and Originals for the Study of Ancient Sculpture,* by Dr. Edmund von Mach.

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BOOK REVIEWS

SCIENTIFIC CONFIRMATIONS OF OLD TESTAMENT HISTORY*

IN THE preface of this new book by Professor Wright, dated November 3, 1906, he states that its principal themes were presented in the Stone Lectures at Princeton in 1904. The next year he made a third extended visit to Egypt, Palestine, and other countries of the Old World, for the completion of this investigation and discussion of the Old Testament History.

**Scientific Confirmations of Old Testament History.* By G. Frederick Wright, D.D., LL.D., F.G.S.A. Pages xviii, 432; with 32 illustrations and 8 maps. Oberlin, Ohio, Bibliotheca Sacra Co., 1906.

The subjects of the 12 chapters are as follows: The Witness of the New Testament; Middle and Later Jewish History; Israel in Egypt; The Exodus; Physical Preparation for Israel in Palestine; Traditions of the Deluge; Scientific Credibility of the Deluge; The Glacial Epoch as a Vera Causa; Evidences of a Deluge in Europe; Evidence of a Deluge in Asia; The Deluge in North America; and Genesis and Science.

This work is the matured result of studies by Professor Wright during the last 14 years in which he has held at Oberlin College the professorship of The Harmony of Science and Revelation. Another part of his studies, on the origin and antiquity of the human race, will form a later volume.

Many instances of the miraculous intervention of God, recorded in the Old Testament, changing the ordinary operations of nature, as when the people of Israel crossed the beds of the Red Sea and of the Jordan on dry ground, are referred to exceptional natural agencies called into action by Providence at the opportune time and place.

The Bible narrative explicitly says that the water of the Red Sea was removed "by a strong east wind, which blew all night" and "made the sea dry land," and when the water returned and overwhelmed the pursuing Egyptians, it was God who "did blow with his wind that the sea should cover them."

Concerning the parting of the waters of the Jordan, recorded in the third chapter of Joshua, Professor Wright says:

> This is certainly a very simple and straightforward description of a natural phenomenon. There is nothing fantastic about it, and nothing incongruous with the surrounding condition. It is said that the waters from above, that is, upstream, rose up and extended as far as the city of Adam, a distance of several miles, and that the supply of water was cut off that formerly ran down to the Salt Sea. This is a very accurate account of what would occur if suddenly a dam was thrown across the stream, some little distance above, ponding the water back on that side, and cutting off the supply below. When first visiting the scene, I was greatly surprised to see that I had not read the account with sufficient care to appreciate its simplicity and accuracy.
>
> There are two natural agencies that at this point could easily have produced the phenomena here described. By some it has been thought that the obstruction was caused by a land-slip somewhere above, which temporarily cut off the water below. But it is equally possible that the obstruction was produced by a gentle swell of the land across the channel pushed up by an earthquake.

The Noachain Deluge is thought by Prof. Wright to have covered only a part of Asia and to have occurred at some time during the Glacial period, when thick sheets of ice were accumulated by snowfall on the northern half of North America and on northwestern Europe. The time of final melting away of these ice-sheets, according to careful computations and estimates by many American and European geologists, was between 10 and 5,000 years ago.

From his very extensive explorations of the glacial drift and his important published works on that period, the author notes many and widely extended evidences of marine submergence of coastal parts of the glaciated lands at the time of final departure of the ice-sheets. At

the same time other large inland areas were temporarily covered by glacial lakes, pent up in basins formed on one side by land slopes and on the other by the barrier of the retreating ice. These flooded conditions upon large parts of the glaciated regions are very interestingly correlated with the flood from which Noah and his family were saved.

Students of the Bible and of geology will find this a very helpful book for its light on the relationship and harmony of the twofold revelations of God to man, in the written word and in the creation of the world.

St. Paul, Minn. WARREN UPHAM.

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BIBLE SIDE LIGHTS FROM THE MOUND OF GEZER*

THIS beautifully printed and amply illustrated volume is issued as a fore-runner of the full publications of the Palestine Exploration Fund. That publication will be so technical and will be so long delayed that the necessity of popularizing it and of giving the main results in advance is very readily seen. The exploration of no site in Palestine has been more fruitful in results than that of Gezer, whose situation was unknown 30 years ago. The discovery was made by Prof. Clermont-Ganneau through a chance reference of a mediæval Arab in history. The place is about 5 miles southeast of the modern town of Ramleh. The ruins consist to the eye of a mound of earth some 40 ft. in height resting upon a rock eminence and admirably adapted for defense in early times. The exploration of the remains by the author of this volume reveals successive strata of debris enclosing the remains of as many successive stages of culture. As early as 3,000 B. C. the bare rocky hill was occupied by a primitive race of cave dwellers, who 500 years later were evidently driven out by a stronger and more civilized people, supposed to be the Canaanites, who were contemporary with Israel. At a later period these were conquered by the Egyptians of the Middle Empire. Gezer was captured by Thothemes III and remained under the suzerainty of the Egyptians for a long period. References to Gezer in the Bible are numerous. The King of Gezer assisted Lacish to resist the siege by Joshua. Later, Gezer was alloted to the Levites. In the time of David the Philistines were in possession of the city and were not wholly driven out until Solomon's time.

The results of the author's explorations in illustrating the historical references of that early period are far greater than was expected. For a full appreciation the reader must refer to the volume itself. We content ourselves with giving somewhat fully the statements illustrating how Samson pulled down the temple upon the Philistines who were making sport of him.

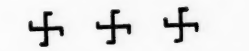
*_Bible Side-Lights from the Mound of Gezer_, A Record of Excavation and Discovery in Palestine, by R. A. Stewart Macalister, M.A., F.S.A., Director of Excavations, Palestine Exploration Fund. Illustrated. Charles Scribner's Sons, New York, 1906.

In the course of the excavation, in a stratum some 300 years older than the time of Samson, was found a building which answered the required conditions of the story to a remarkable extent. That it was a temple of some sort was indicated by religious emblems found within its precincts, and by a waste-pit full of sheep-bones, apparently those of sacrificial victims. The building was much ruined, only the foundations remaining; but enough was left to enable us to restore it with a considerable degree of probability.

We see a forecourt, with a row of four column-bases separating it from a paved area. It is certain that these bases were meant for the support, not of stone pillars, but of vertical posts of wood, like the *cedar pillars* of Solomon's house, I Kings vii:2; and were intended to prevent their comparatively narrow ends from sinking into the ground under the pressure of whatever weight they had to bear.

If we picture this Gezer temple, and like it the temple of Dagon at Gaza, as having a portico supported by four wooden pillars we can get rid at once of the monstrous conception of Samson snapping two great stone pillars to which artists have accustomed us. Nor is there anything in the Bible to warrant such a conception. On the contrary, the whole description of Samson's feat points to the action that would be necessary in pushing or pulling a wooden beam so that its foot would slide over a stone at the base. *He took hold of the two middle pillars and leaned upon them—and he bowed himself with all his might, and the house fell.* The words evidently denote a sudden impulse producing a slight displacement of the pillars, which would then fall of themselves. To adopt this reading of the story in no way detracts from the glory of Samson's strength and achievements. It brings the story into the region of the possible, but it does not take it out of the region of the marvelous.

GEORGE FREDERICK WRIGHT.



THE GLACIAL HISTORY OF NANTUCKET AND CAPE COD*

THIS volume adds another chapter to the increasing wonders of the Glacial Period. Heretofore, three centers for the accumulation of glacial ice had been recognized: 1. In the Cordilleran Mountains on the Pacific Coast south of Alaska, which sent its ice sheet southward to Puget Sound and northward to the Yukon River; 2. The area west of Hudson's Bay from which there was a southward movement, according to Chamberlin and Salisbury, to the southern part of Illinois, a distance of 1,600 miles, and northward to the Arctic Ocean; 3. Labrador, from which the movement extended to the southern part of Ohio and to New York City. The author has demonstrated that there was a fourth center located in Newfoundland during a time of extensive land elevation. The effect of this movement is found in boulders transported southwestward to Nantucket. That the material transported was by land ice and not by floating ice seems amply demonstrated by the author. The work represents a great amount of original exploration and a masterly comprehension of the details involved. The conclusions of the author can not well be avoided.

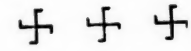
GEORGE FREDERICK WRIGHT.

**The Glacial History of Nantucket and Cape Cod*, with an Argument for a Fourth Center of Glacial Dispersion in North America, by J. Howard Wilson, A.M., Ph.D. The Columbia University Press, New York, 1906.

REPORT OF THE WISCONSIN ARCHAEOLOGICAL SOCIETY

The Wisconsin Archeologist for the months from April to October, 1906, consists of a Record of Wisconsin Antiquities. The Secretary and Curator of the Wisconsin Archeological Society, Chas. E. Brown used as a basis such parts of the *Catalogue of Prehistoric Works East of the Rocky Mountains** as pertained to Wisconsin. All known material of an archæological nature is noticed under the township and county where it was found, and note is made as to the time of discovery and references to printed reports are given. Sixty-one of the 71 counties in the state are represented. The excellent work of the Wisconsin Society is indicated by the fact that, although the society has been organized only 5 years, this report adds records from 12 counties not included in Dr. Thomas' work. The value of the work as a basis for further investigation can hardly be overestimated. The author in his introduction says, "Though very incomplete and but little more than an index to the archæological wealth of our state, the present record should furnish an excellent basis for future researches and will, it is hoped, encourage further contributions to our as yet meager knowledge of Wisconsin archæological history." It is to be regretted that more of our states have not societies working so steadily and practically upon problems of local archæology.

The report is well illustrated by half-tones of some of Wisconsin's archæologists, mounds and implements and by a map showing the location of single mounds, groups of mounds, including those in the shape of effigies.



EDITORIAL NOTES

INDIAN ARROW STAND.—A "rich arrow" stand has been reported as discovered at Conesus Lake, N. Y. There is a larger proportion of war arrowheads found here than is usually the case.

TO ENFORCE ARCHÆOLOGICAL LEGISLATION.—Gen. George B. Davis, judge-advocate general of the army, has been appointed to represent the War Department on the committee to enforce the act of Congress of June 8, 1906, for preserving American antiquities. The representatives of the Department of the Interior are Mr. W. Bertrand Acker, chief of patents and miscellaneous division of the Secretary's office. The representatives of the Department of Agriculture and the Smithsonian Institution have not yet been announced.

*Dr. Cyrus Thomas, Bureau of Ethnology, Smithsonian Institution, 1891.

CAMPANILE AT VENICE.—The work of restoring the Campanile at Venice is progressing rapidly, and the plans show that the external appearance of this old familiar landmark of Venice will be preserved, while internal improvements, such as an electric elevator will be made. The most important fragments of the tower have been recovered from the debris and are being restored with great fidelity. Among these are the bronze gates, the ancient Logetta, the golden angel, which crowned the summit and the bell. The most remarkable piece of restoration, however, is that of the statue of the Madonna which was broken into over 1,600 fragments, but has been so skilfully put together that "it is impossible to believe that it could have been once so apparently hopelessly damaged."

NUBIAN MANUSCRIPTS.—While examining some sheets of parchment bought at Cairo for Coptic manuscripts, Carl Schmidt made a discovery of much importance to philology and history. The repetition of the word "Uru," which among modern Nubians means king, convinced the German savant, who is an authority on Coptic and the early Christian archæology of Upper Egypt, that the text was Nubian, a language which, although still spoken, is no longer written. The manuscripts date from the VIII century A. D., and are translations of Christian works in which frequent references to St. Paul are made. One manuscript is a collection of extracts from the New Testament, and the other a hymn of the cross. The Greek original of the hymn is not known. When the documents are deciphered philological science will be enriched by the knowledge of the language spoken by the people of Nubia before the invasion of Semitic tribes, and the mysterious inscriptions on many of the Egyptian monuments may be read. [*Scientific American.*]

MARBLE HEAD FOUND IN BELGIUM.—In 1905 a marble head was found near Ottignies, Belgium, which is described in the *Bulletin des Musées Royaux a Bruxelles.* Its especial value lies in the fact that it is probably the only ancient marble figure preserved in Belgium. Almost always the Roman artists made the figures of their divinities and their funeral monuments of the limestone and sandstone of the region, for the obvious reason that marble had to be brought from so great a distance. Although this relic is badly mutilated, yet it is possible to recognize the head of a woman with her hair parted in the middle and falling down on each side. This was the fashion of the latter part of the II century and the III century A. D. The sides of the head and the nape are missing. The head was made in separate pieces fitted together and, without doubt, the lines of joining were hidden by a colored stucco. Evidently the sculptor could not secure a single piece large enough for his purpose. The date assigned is the time of Severus. In all probability it is the portrait of some rich gentlewoman, and was intended for her funeral monument. As the back is neglected, the figure may have been placed in a niche.

FURTHER NOTE ON THE DOME OF SS. SERGIUS AND BACCHUS AT CONSTANTINOPLE.—After the article by Dr. Allan Marquand was received by us for publication [See RECORDS OF THE PAST for December, 1906], the following additional note was forwarded by Dr. Marquand from Professor Howard Crosby Butler, of Princeton University, who visited Constantinople recently. "The latest description of this dome, that of Mr. Lethaby, does not appear to me to be altogether accurate. He is certainly inaccurate in saying that each angle of the octagon is rounded into a niche, since the octagon below the dome shows 8 obtuse angles, but no niches. The cells of the dome over the angles are concave to the interior, as he says; but so are the others when they come to the sharp curve of the dome, though they are not so deeply concave as the former. Taking the dome by itself, it seems to me that we may consider the lower portion as a sort of drum with 16 sides inclined slightly inward, alternate sides being concave. This drum extends up to the level of a line drawn through the dome windows, just below their arched tops. Above this level the sharp curve begins and the flat sides become slightly concave. Sections cut through the dome at 3 different points, viz., through the ribs, through the concave sides, through the flat sides which become concave, would show 3 different profiles. As the cells approach the apex of the dome, all become nearly flat."

ARTEMIS EPHESIA.—During 1904 and 1905 the British Museum bore the expense of re-examination of the site of the temple of Artemis at Ephesus. The complete ground plan of the temple of the VI century B. C. was discovered below the Hellenistic stratum, and much new evidence of its architectural character, as well as many small objects, including cult-figurines of the goddess. The remains of 3 distinct temples of the period before Crœsus were found. These were smaller than the others, one being apparently a *naos* large enough to contain a statute and altar. "The foundation of this shrine lies at the intersection of the *axes* of all the successive temples alike, and it is evident that at all periods it was the central Holy of Holies where stood the cultus-statue." This central structure was found to be a platform made solid with a filling of flat slabs, with a quantity of small gold, electrum, silver, bronze, ivory and amber objects, even some electrum coins of early date. Many are articles of personal adornment undoubtedly placed there for the use of the goddess, whose statue stood above. They seem to belong to the VIII and VII centuries B. C. At a little distance were found many other relics of similar age, especially five statuettes, and other objects in ivory, crystal, metal, etc., and coins, but little jewelry. There are many representations of Artemis and her attributes, showing that she was locally personified from the VIII to the IV centuries B. C.